

## **The influence of multi-domain configurations on the magnetoresistance of rectangular permalloy**

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Microstructures with various thicknesses is studied. The anisotropic magnetoresistance (AMR) is the dominating resistance contribution in these systems. Reversible and irreversible magnetization reversals lead to complex AMR signals. Appropriate positioning of the voltage probes allows the local detection of the magnetoresistance. Two methods for calculating the local AMR, the uniform-current model and diffusive transport calculations, are described. The latter takes potential differences and inhomogenous current paths into account. By comparing magnetoresistance measurements, micromagnetic simulations, and images of magnetic-force microscopy for various film thicknesses, we can exactly link the transitions between magnetic configurations to changes observed in the magnetoresistance. "